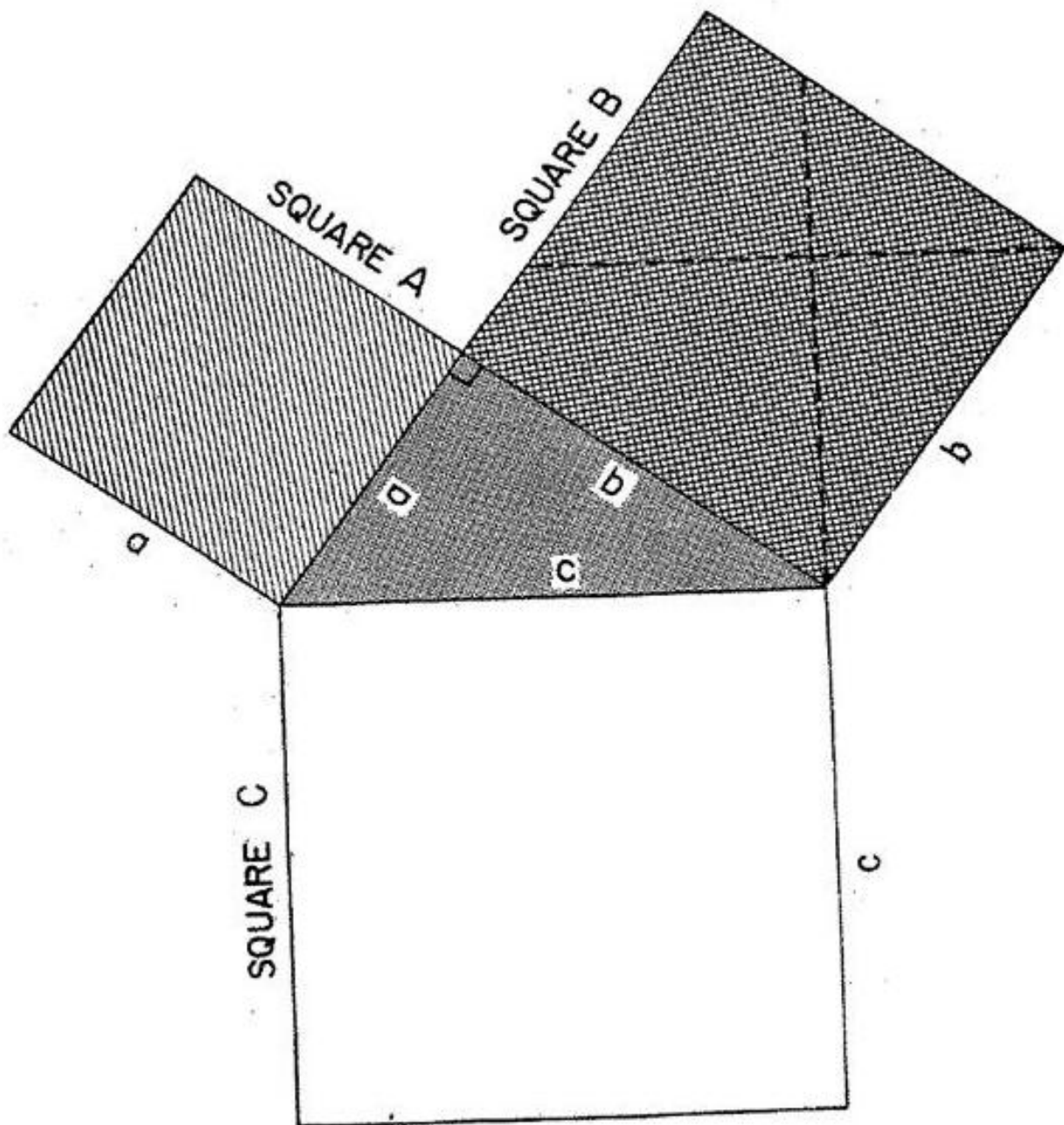
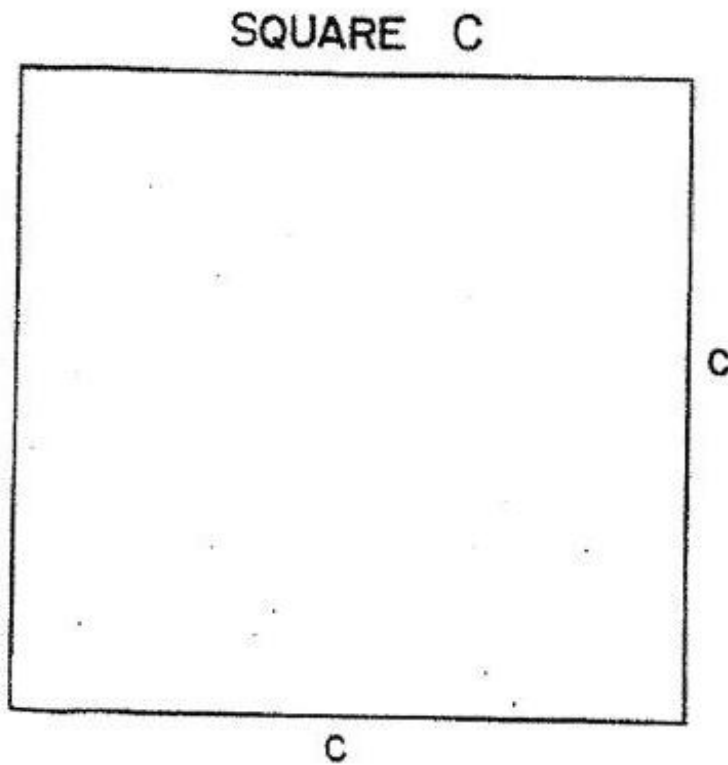


Pythagorean Puzzle #1

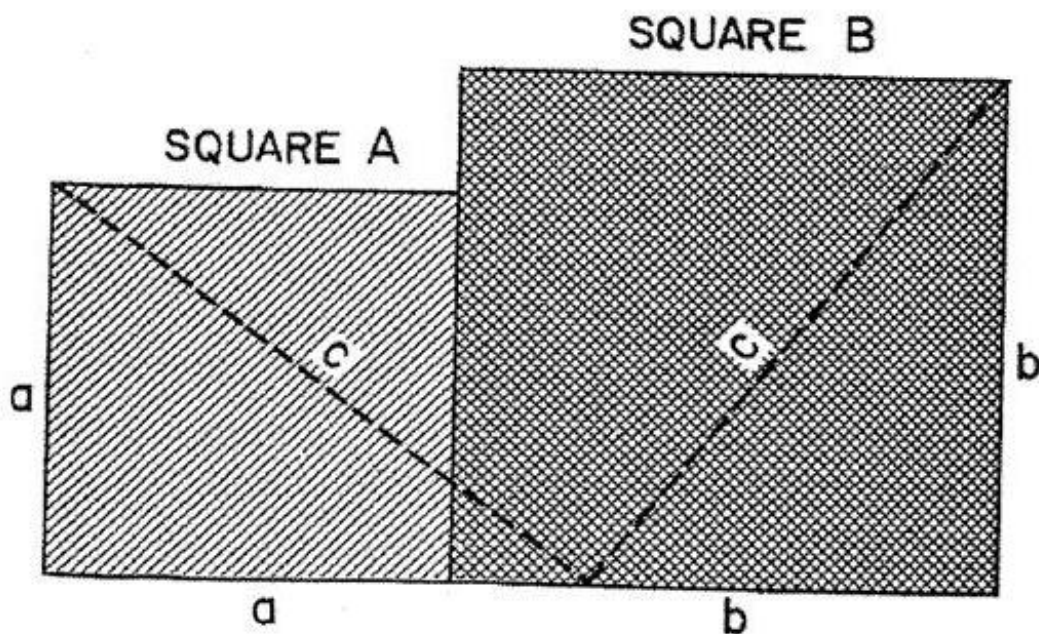
1. Cut out square A and the four pieces from square B.
2. Show how the pieces can be arranged to cover square C.
3. Does $a^2 + b^2 = c^2$? Why or why not?



Pythagorean Puzzle #2

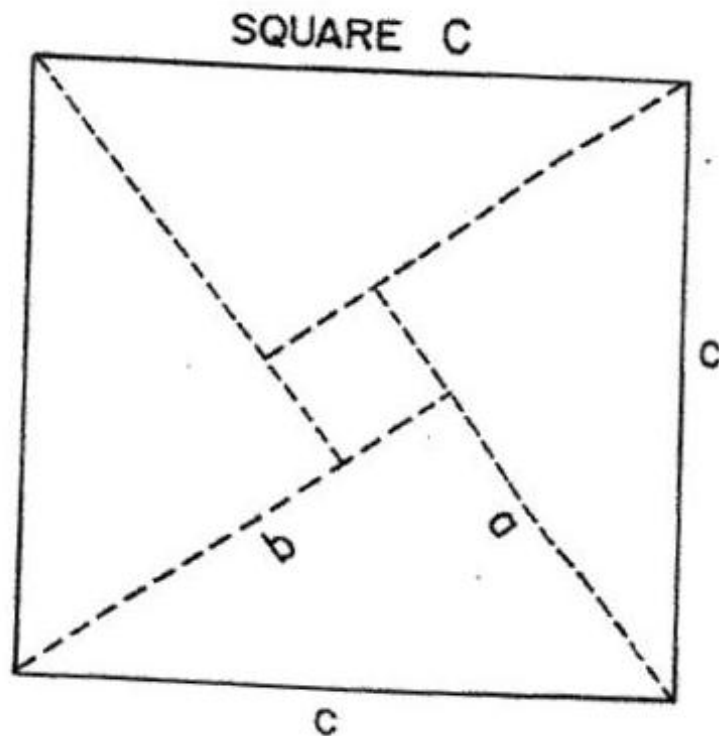
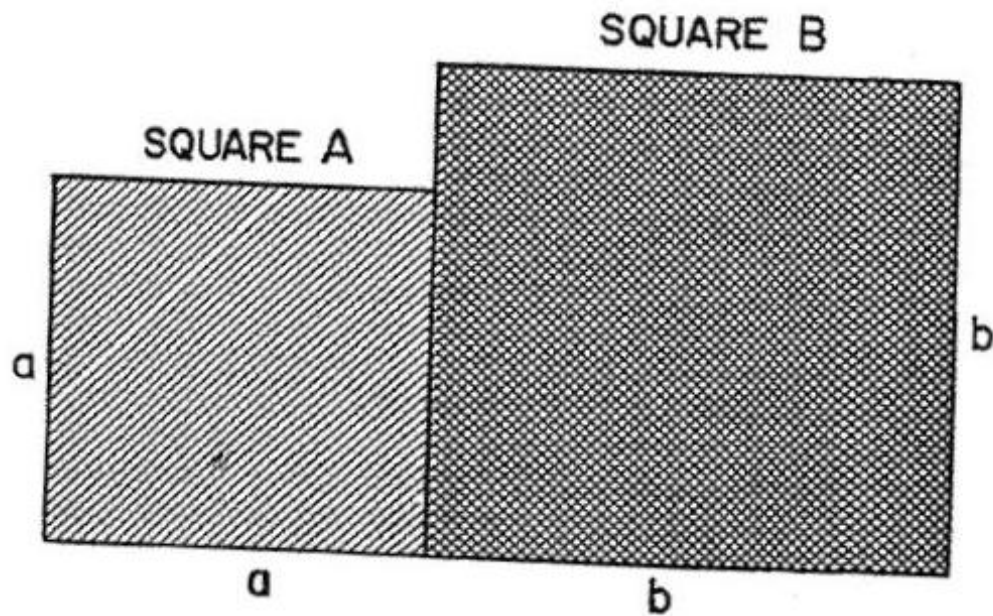


1. Cut out the five pieces from squares A and B.
2. Show how the pieces can be arranged to cover square C.
3. Does $a^2 + b^2 = c^2$? Why or why not?



Pythagorean Puzzle #3

1. Cut out the pieces from square C.
2. Show how the pieces can be arranged to cover squares A and B.
3. Does $a^2 + b^2 = c^2$? Why or why not?



Pythagorean Triples!

There are even shortcuts to solving the Pythagorean Theorem because of some great numbers called Pythagorean Triples. If you can find three whole numbers for a, b, and c that make the Pythagorean Theorem true, they are called Pythagorean Triples.

Example: 3, 4, and 5

$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25 \text{ is true}$$

How many more can you find?

Short Leg	Long Leg	Hypotenuse
3	4	5
5		13
7	24	
8		
n		

Is there an easier way to find triples?

Try this...

1. Square an odd number (try 3: $3^2 = 9$).

2. Are the two other numbers in the triple

$$\frac{n^2}{2} - .5 \text{ and } \frac{n^2}{2} + .5?$$

$$\left(\frac{n^2}{2} - .5 = 4 \text{ and } \frac{n^2}{2} + .5 = 5 \right)$$

3. Check this rule out for other numbers. Can you find other triples this way?

What else can the Pythagorean Theorem tell us?

Remember that when you use the Pythagorean Theorem, "a" and "b" should always be lengths of the legs and "c" (the longest side) should be the length of the hypotenuse.

Use GeoLegs to make these triangles. Then look at the angles.

How can you tell what kind of triangles you have (acute, right or obtuse) if all you know are the lengths of the sides of a triangle?

Triangle #	Side lengths	2 shortest sides (a and b)	Longest side (c)	Which is bigger? (choose one) $a^2 + b^2$ or c^2 or are they equal?	Type of Triangle? (choose one) Acute Triangle Right Triangle Obtuse Triangle
1	10, 13, 18				
2	25, 12, 16				
3	16, 18, 14				

Try some other triangles. If you only know the lengths of the sides of the triangle, can you tell if the triangle is acute, obtuse or right? Explain.